Pesticide Clearinghouse Summary for the Nebraska Department of Agriculture
Progress Report for the period October 1, 2004 to September 30, 2005

This summary of activities associated with the Nebraska Ground-water Pesticide Clearinghouse is submitted in fulfillment of a cooperative agreement between the Nebraska Department of Agriculture and the Board of Regents of the University of Nebraska.

The Database

The database currently contains 270,473 pesticide analyses for 4,888 wells. This is a 104% increase in the number of pesticide analyses and an 18% increase in the number of sampled wells since the 2004 progress report. The addition of the 1991 – 1996 Management Systems Evaluation Area (MSEA) data (127,835 analyses in 638 wells) accounts for most of the increase. Excluding the MSEA data, the increases in the number of pesticide analyses and the number of wells are 8% and 3%, respectively.

During the last year 33 pesticide analytes measured by the USGS were added to the database. To date 149 pesticides and pesticide degradates have been measured in Nebraska ground water. Table 1 contains the complete list of analytes.

This year 93% of the pesticide data added to the database were from the MSEA monitoring wells, with the remainder consisting of non-MSEA monitoring (2%), irrigation (2%), public supply (2%) and domestic (1%) well data. Addition of the MSEA data increased the proportion of monitoring wells significantly; without the MSEA data, the proportions changed little from the previous year (Figure 1). Data from domestic wells still constitute a significant portion (33%) of the non-MSEA portion of the database; however, the proportion declines each year as more data are acquired from irrigation and monitoring wells. About 7% of the data are from public supply wells. Stock and industrial well data do not contribute significantly to the database.

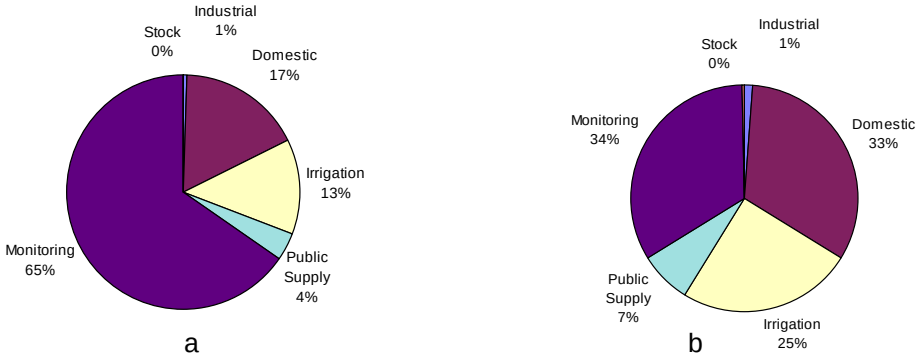

Figure 1. Distribution of the data by well use, with (a) and without (b) MSEA data included.

Figure 2 shows the relative contribution of each agency to the pesticide database. The majority of the data added during the past year came from the MSEA project (1991-1996) and the Lower Platte South NRD (2004). Data from the Nebraska Department of Environmental Quality (Lincoln County GWMA, 2003) and from some older USGS projects (1995-2001) also were added. The MSEA data increase UNL's contribution to the database to 57%. When the MSEA data are disregarded, each agency's contribution remains relatively unchanged from last year.

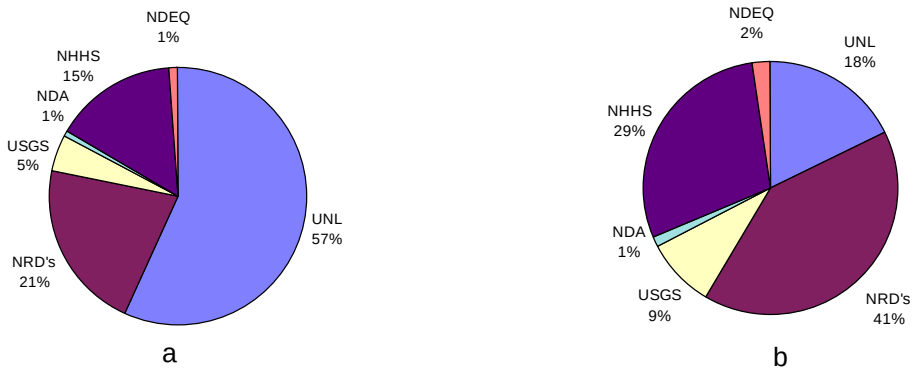

Figure 2. Sources of the pesticide data, with (a) and without (b) MSEA data included.

Twenty-four pesticides and four degradates have been detected in Nebraska ground water during the period from 1976 to 2004 (Table 1). In the last year chloroform and tebuthiuron were added to the list of detected pesticides. Both detections were in older USGS data added to the database this year. A chloroform concentration of 0.28 μg/L was measured in a 36-ft domestic well in 1997 while tebuthiuron was detected in 1995 at a concentration of 0.01 μg/L in a 17-ft monitoring well.

Atrazine remains the pesticide most frequently detected in Nebraska ground water. Figure 3 shows the 1667 non-MSEA wells sampled for atrazine in the 10-year period from 1995-2004. Atrazine was detected in 15.1% of the wells. The atrazine degradates deethylatrazine (DEA) and deisopropylatrazine (DIA) were detected in 29.4% and 6.1%, respectively, of the wells in which they were measured. Alachlor, metolachlor and simazine were detected in 0.8%, 4.2% and 1.0% of the wells, respectively.

The incidence of atrazine and DEA detections has decreased significantly from 21.5% and 38.9%, respectively, in the five year period from 1999-2003 to 16.6% and 21.4%, respectively, in the most recent five-year period (2000-2004). Metolachlor, DIA, and alachlor detections decreased slightly from 7.3%, 5.4 % and 1.8%, respectively from 1999-2003 to 6.2%, 3.8%, and 1.1%, respectively, from 2000-2004.

During the period 1995-2004, atrazine concentrations exceeded the maximum contaminant level (MCL) of 3 μg/L in 0.3% of the wells. None of the pesticide concentrations measured in Nebraska ground water in the last five years (2000-2004) exceed MCLs or health advisory levels.

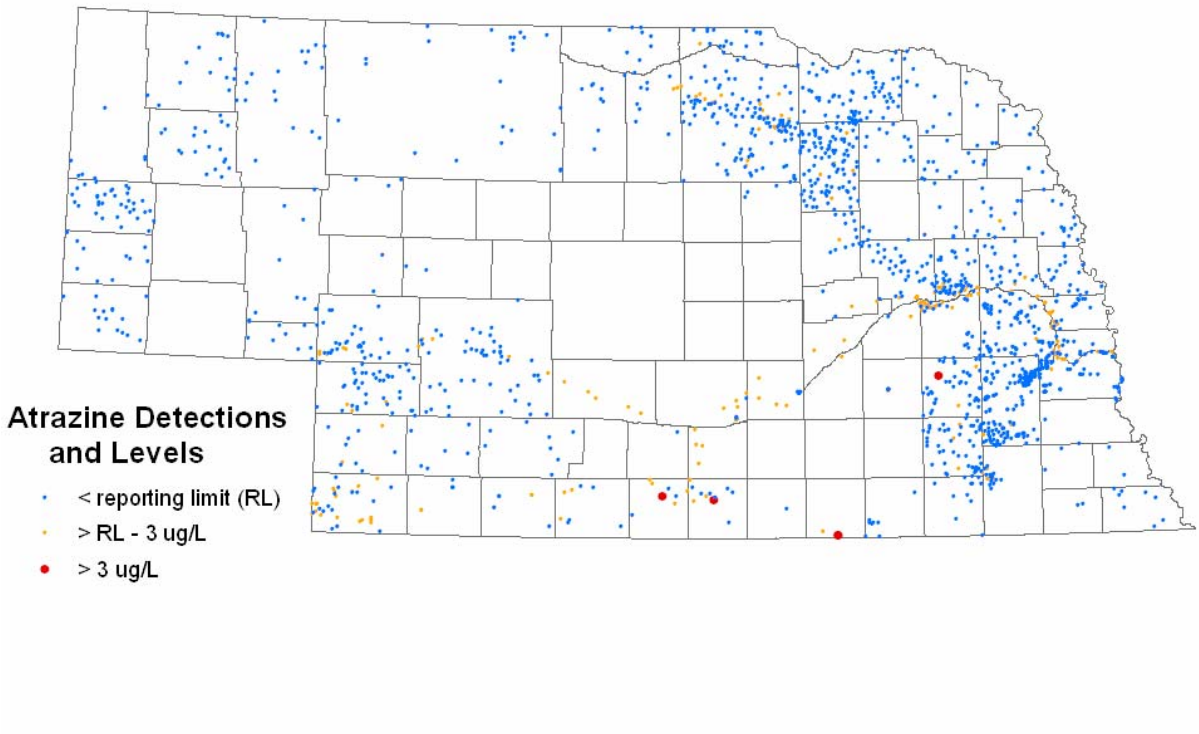

Figure 3. Locations and levels of atrazine in wells sampled, 1995-2004. MSEA data are not included.

The pesticide data added in the last year had quality assessment levels of 3, 4, and 5. Most of the non-MSEA data had a quality assessment level of 3 while the MSEA data met the criteria for level 4 and 5 data. Figure 4 shows that the proportion of level 4 and 5 data declined significantly for the period 2000-2004. With the addition of 2002 – 2004 USGS data in the coming year, the proportion of level 4 data should increase.

Summary of 2005 Activities

The 2004 NRD data were acquired during 2005 and these data together with the six years of quarterly MSEA data and holdover 1995-2001 USGS data were incorporated into the database. Because most of the 2004 NRD data was received in the spring and summer, few additions to the database occurred prior to July; consequently, the only update released to the DNR was in September.

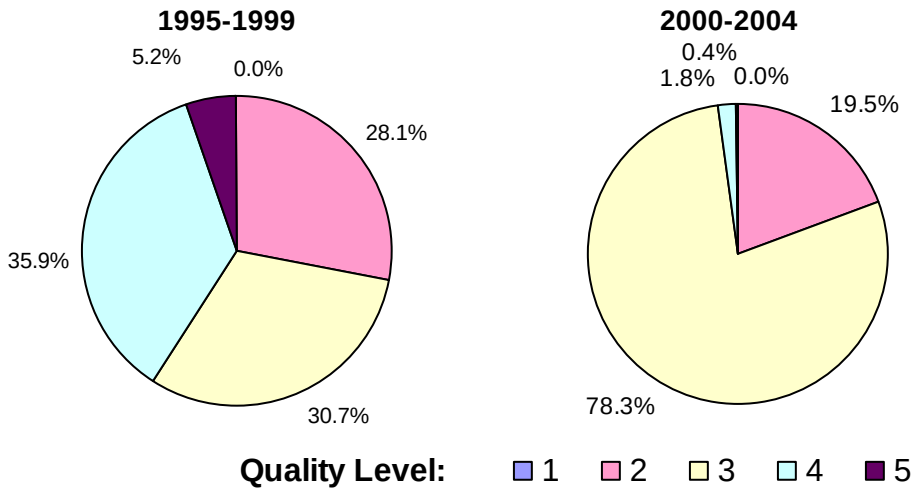

Figure 4. Percent of analyte data for each quality assessment level for the periods 1995-1999 and 2000-2004. MSEA data are not included in this analysis.

Future Activities

The upcoming year's focus will be the assessment and incorporation of 2002-2003 USGS data and the acquisition, assessment and incorporation of the 2004 USGS and 2005 NRD data. Updates of the database will be submitted to DNR quarterly for dissemination to the website. The late September update will include all the 2005 NRD data and ensures that NDEQ and NDA year-end reports are based on the latest available data. The metadata also will be reviewed and updated quarterly.

It is anticipated that the coming year will bring changes to the website that allow the sampling locations to be viewed on a map.

Table 1. Pesticide analytes and the number of wells in which the parameter was measured.

Pesticide	Number of Wells	Pesticide	Number of Wells
1,1,1-trichloroethane	34	carbofuran	2352
1,2,4-trichlorobenzene	34	carbon tetrachloride *	191
1,2-dibromo-3-chloropropane	34	carboxin	100
1,2-dibromoethane	191	chlordane	241
1,2-dichlorobenzene	34	chloroform *	32
1,2-dichloroethane	34	chlorothalonil	27
1,2-dichloropropane	34	chlorpyrifos *	2727
1,4-dichlorobenzene	34	cis-permethrin	31
1-naphthol	32	clopyralid	27
2,4,5-T	68	cyanazine *	4231
2,4,6-trichlorophenol	10	cycloate	100
2,4-D	89	cyprazine	71
2,4-DB	27	DCPA	42
2,4-dinitrophenol	10	DCPA mono and diacids	37
2,4-DP	27	DDD	180
2,6-diethylaniline	32	DDE	212
3-hyroxycarbofuran	27	DDT	180
4,6-dinitro-o-cresol	27	deethylatrazine *	1764
4-chloro-3-methylphenol	10	deisopropylatrazine *	1712
4-nitrophenol	10	delta-BHC	162
acenaphthene	10	diazinon	191
acetochlor *	1229	dicamba	67
acifluorfen	27	dichlobenil	27
acrylonitrile	30	didealkyl atrazine	18
alachlor *	4196	dieldrin	367
aldicarb	40	dimethenamid	295
aldicarb sulfone	40	dinoseb	27
aldicarb sulfoxide	27	diphenamid	100
aldrin *	284	disulfoton	180
alpha-BHC	194	diuron	26
ametryn *	705	endosulfan I	162
atrazine *	4454	endosulfan II	162
azinphos-methyl	1	endosulfan sulfate	162
benfluralin	284	endrin	367
bentazon	26	endrin aldehyde	162
beta-BHC	162	EPTC *	1604
bromacil	127	esfenvalerate	19
bromomethane	34	ethalfluralin	322
bromoxynil	27	ethion	1
butachlor	473	ethoprop	32
butylate *	3559	ethyl parathion	2136
carbaryl	2320	fenuron	27

* Detected in at least one sample.

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Table 1. (continued)

Pesticide	Number of Wells	Pesticide	Number of Wells
fluometuron	27	pebulate	32
fonofos *	3535	pendimethalin *	1140
gamma-BHC	164	pentachlorophenol	10
heptachlor	284	permethrin *	819
heptachlor epoxide	283	phorate	420
hexachlorobenzene	131	picloram	27
hexachlorocyclopentadiene	131	prometon *	1968
hexazinone	100	prometryn *	655
isofenphos	70	pronamide	31
isoxaflutole	557	propachlor *	1933
isoxaflutole benzoic acid *	557	propanil	32
isoxaflutole diketonitrile *	557	propargite	32
lindane	237	propazine *	1947
linuron	32	propham	40
malathion	71	propoxur	40
MCPA	27	propyzamide	1
MCPB	27	silvex	67
methiocarb	40	simazine *	2077
methomyl	40	simetryn	194
methoxychlor	367	tebuthiuron *	32
methyl azinphos	31	terbacil	132
methyl parathion *	2205	terbufos	3379
methylene chloride	34	terbuthylazine	6
metolachlor*	4014	terbutryn	84
metribuzin *	4087	tetrachloroethene	34
molinate	32	thiobencarb	32
naphthalene	34	toxaphene	246
napropamide	32	triallate	284
neburon	27	trichloroethene	34
norflurazon	27	triclopyr	27
oryzalin	27	trifluralin *	3914
oxamyl	27	vernolate	100
parathion	167		

* Detected in at least one sample.